

5    What is Claimed is:

1    A white LED comprising:

a substrate;

a first light emission part of III-V family compound semiconductor on the substrate  
for emission of a light;

10        a second light emission part of II-VI family compound semiconductor on the first  
light emission part for emission of a light; and,

electrodes in regions of the substrate, and the first and second light emission parts.

15        2. A white LED as claimed in claim 1, further comprising a metal contact layer on  
each of the first and second light emission parts.

3. A white LED as claimed in claim 2, wherein the metal contact layer is of a GaAs  
group

20        4. A white LED as claimed in claim 1, wherein the first light emission part includes  
multi-quantum well structure of GaAs/AlGaAs group, or InGaP/AlInGaP group.

5. A white LED as claimed in claim 1, wherein the second light emission part  
includes multi-quantum well structure of ZnCdSe/ZnMgSSe group or ZnCdSe/ZnMgBeSe.

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6. A white LED as claimed in claim 1, wherein the electrodes includes;

a first electrode under the substrate,

a second electrode on the first light emission part, and

5 a third electrode on the second light emission part.

7. A white LED as claimed in claim 1, wherein the electrodes includes;

a first electrode under the substrate,

10 a plurality of second electrodes formed on the first light emission part at fixed intervals, and

a plurality of third electrodes formed on the second light emission part at fixed intervals, wherein a fixed width groove is formed between adjacent second electrodes and the adjacent third electrodes, to isolate the electrodes.

15 8. A white LED as claimed in claim 7, wherein the groove has a depth not to expose light emission areas of the first and second light emission parts.

9. A white LED as claimed in claim 1, wherein the substrate is formed of a material selected from GaAs group or ZnSe group.

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10. A white LED as claimed in claim 1, wherein the first and second light emission parts emit lights of wavelengths different from each other

11 A white LED comprising:

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a GaAs substrate,

a first light emission part of multi-quantum well structure of GaAs/AlGaAs or InGaP/AlInGaP on the GaAs substrate having a stack of a first clad layer, a first active layer, and a second clad layer disposed in succession;

5 a GaAs first contact layer on the first light emission part;  
a second light emission part of multi-quantum well structure of ZnCdSe/ZnMgSSe or ZnCdSe/ZnMgBeSe on the GaAs contact layer having a stack of a third clad layer, a second active layer, and a fourth clad layer disposed in succession;  
a GaAs second contact layer on the second light emission part; and,  
10 electrodes under the substrate, and regions of the first and second contact parts.

12. A white LED as claimed in claim 11, wherein the substrate and the first contact layer are of different conduction types, and the substrate and the second contact layer are of the same conduction type.

15 13. A white LED comprising:  
a GaAs substrate;  
a first light emission part of multi-quantum well structure of GaAs/AlGaAs or InGaP/AlInGaP on the GaAs substrate having a stack of a first clad layer, a first active layer,  
20 and a second clad layer disposed in succession;

a GaAs first contact layer on the first light emission part;  
a second light emission part of multi-quantum well structure of ZnCdSe/ZnMgSSe or ZnCdSe/ZnMgBeSe on the GaAs contact layer having a stack of a third clad layer, a second active layer, and a fourth clad layer disposed in succession;

25 a GaAs second contact layer on the second light emission part;  
a first electrode under the substrate;  
a plurality of second electrodes on the first contact layer;  
a plurality of third electrodes on the second contact layer; and,

5           grooves between the second electrodes and between the third electrodes each having  
a depth for isolating one another.

14. A white LED as claimed in claim 13, wherein the substrate and the first contact  
layer are of different conduction types, and the substrate and the second contact layer are of  
10   the same conduction type.

15   A white LED as claimed in claim 13, wherein the groove has a depth not to  
expose active layers of the first and second light emission parts.

16. A method for fabricating a white LED, comprising the steps of:

(a) forming a first light emission part of multi-quantum well structure of  
GaAs/AlGaAs or InGaP/AlInGaP on a GaAs substrate, and a GaAs first contact layer on the  
first light emission part;

(b) forming a second light emission part of multi-quantum well structure of  
20   ZnCdSe/ZnMgSSe or ZnCdSe/ZnMgBeSe on the GaAs contact layer, and a GaAs second  
contact layer on the second light emission part;

(c) etching a portion of the GaAs contact layer and the multi-quantum well structure  
of ZnCdSe/ZnMgSSe or ZnCdSe/ZnMgBeSe under the GaAs contact layer, for exposing the  
GaAs first contact layer; and,

25   (d) forming electrodes under the substrate and regions of the first and second contact  
layers.

17. A method as claimed in claim 16, further comprising the step of etching the

5 exposed GaAs first, and second contact layers and a region under the first, and second layers to a depth, to form grooves, after the step (c).

18. A method as claimed in claim 16, wherein the substrate and the first contact layer are of different conduction types, and the substrate and the second contact layer are of the  
10 same conduction type.

19. A method as claimed in claim 16, wherein the first light emission part is formed by MOCVD (Metal Organic Chemical Vapor Deposition), or MBE (Molecular Beam Epitaxy).

20. A method as claimed in claim 16, wherein the second light emission part is  
15 formed by MOCVD (Metal Organic Chemical Vapor Deposition), or MBE (Molecular Beam Epitaxy).